

# **APPARATUS AND METHODS FOR REDUCING DAMAGE TO SUBSTRATES DURING MEGASONIC CLEANING PROCESSES**

## Abstract of the Disclosure

The present invention provides a megasonic cleaning apparatus configured to provide effective cleaning of a substrate without causing damage to the substrate. The apparatus includes a probe having one of a variety of cross-sections configured to decrease the ratio of normal-incident waves to shallow-angle waves. One such cross-section includes a channel running along a portion of the lower edge of the probe. Another cross-section includes a narrow lower edge of the probe. Another cross-section is elliptical. Another cross-section includes transverse bores originating in the lower edge of the probe. As an alternative to, or in addition to, providing a probe having a cross-section other than circular, the present invention may also provide a probe having a roughened lower surface.

L:\DOCS\SLM\SLM-6111.DOC  
012004  
H:\DOCS\AMD\AMD-5217.DOC  
012004